

Interim Approval™

Puraflo™

January 19, 2001

I. System description.

The Puraflo™ wastewater treatment system consists of the following listed key components. This protocol is based on the specific components listed. Bord na Mona may request and use components deemed equivalent to those described in this document after receiving written approval from the Division of Onsite Sewage and Water Services. Unless otherwise stated, the components of the Puraflo™ system shall comply with the intent, objectives and requirements of the *Sewage Handling and Disposal Regulations*.

- A. Building Sewer. The building sewer used in conjunction with a Puraflo™ system shall comply with Part IV, Article 2 of the *Sewage Handling and Disposal Regulations* (the *Regulations*).
- B. Pretreatment system. The minimum pretreatment system preceding a Puraflo™ system shall be a septic tank designed and installed in compliance with Part V of the *Sewage Handling and Disposal Regulations* but having a holding capacity of not less than 1,000 gallons.
- C. Secondary treatment system. The Puraflo™ system consists of a number of treatment modules, each with a capacity of approximately 125 GPD, nominally 7'1" x 4'7" x 2'6" (L,W,D) containing a proprietary biofibrous media. Septic tank effluent is dosed from a sump to the treatment modules where treatment occurs by a combination of physical, biological and chemical processes. The average treatment capability of the Puraflo™ is reported in Table 1 and, in part, formed the basis for this approval.

Parameter	Effluent Limit
BOD ₅ (mg/l)	10mg/l
TSS (mg/l)	10mg/l
Fecal Coliform	200 cfu

Table 1

- D. Sampling port. Each system shall be provided with a sampling port with access to the ground surface for the purpose of providing access to the treated effluent for compliance testing.

- E. Conveyance system. All effluent conveyance components designed to move effluent from the Puraflo™ system to an absorption area shall comply with the requirements of the *Sewage Handling and Disposal Regulations*.
- F. Absorption area. When the criteria found in the *Sewage Handling and Disposal Regulations* and Figure 1 (of this document) are met, the absorption field shall be designed in accordance with Table 2 below for all systems covered by this policy.

Actual Trench Bottom Area				
	Loading Rates (Gallons per Square Foot) Pad Area	Trenches		
		1.5 Wide	2.0 Wide	3.0 Wide
20 or less	1.66	2.78	2.50	2.22
25	1.33	2.22	2.00	1.78
30	1.11	1.85	1.66	1.48
35	0.95	1.59	1.43	1.27
40	0.83	1.39	1.25	1.11
45	0.74	1.23	1.11	0.99
50	0.67	1.11	1.00	0.89
55	0.61	1.01	0.91	0.81
60	0.55	0.93	0.83	0.74
65	0.51	0.85	0.77	0.68
70	0.48	0.80	0.72	0.64
75	0.44	0.74	0.67	0.59
80	0.42	0.69	0.63	0.56
85	0.39	0.65	0.59	0.52
90	0.37	0.62	0.56	0.49
95	0.35	0.58	0.53	0.47
100	0.33	0.56	0.50	0.44
105	0.32	0.53	0.48	0.42
110	0.30	0.51	0.45	0.40
115	0.29	0.48	0.43	0.39
120	0.28	0.46	0.42	0.37

Table 2**II. Scope of Approval.**

This waiver is granted for use of the Puraflo™ system in conjunction with facilities generating wastewater flows of 1,000 GPD or less and of residential strength (BOD5 <250 mg/l) when used in accordance with the siting criteria contained in this policy.

Larger flows may be permitted but shall be reviewed individually to assure compliance with the requirements of §441 of *Sewage Handling and Disposal Regulations*.

Approval is also granted to the Puraflo™ modules as an aerobic biological system pursuant to §800 of the *Sewage Handling and Disposal Regulations*. This approval is granted for the use of Puraflo™ modules in conjunction with a disposal methodology contained in the *Sewage Handling and Disposal Regulations*. Please note the distinction between the complete “Puraflo™ system” which includes the modules and siting and design criteria specific to the Puraflo™ system and the “Puraflo™ modules.” The modules consist of the biofibrous treatment units and their associated distribution system. The modules are recognized as an approved treatment device, when used to treat residential strength septic tank effluent, suitable for use with disposal methodologies defined within the *Sewage Handling and Disposal Regulations*.

General approval is also granted for the Puraflo™ modules for use as a discharging system under the *Alternative Discharging Sewage Treatment Regulations for Individual Single Family Dwellings* (12 VAC 5-640-10 et seq.).

III. Siting Criteria.

The Puraflo™ system may be used to provide wastewater treatment at any site that meets one of the following classifications:

1. Any site that does not comply with the minimum stand-off to rock and/or water table requirements contained in the *Sewage Handling and Disposal Regulations* but does comply with the requirements of Figure 1.
2. Any site that fully complies with the criteria contained in the *Sewage Handling and Disposal Regulations*, including but not limited to absorption area sizing percolation rate, landscape position, stand-off distances, and set-back distances.
3. Any site that complies with §280 C.2. For sites complying with §280 C.2, the homeowner may elect to use a system permitted under the *Sewage Handling and Disposal Regulations* that incorporates Puraflo™ modules for pretreatment or a Puraflo™ system as described in this policy.

IV. System Design.

All portions of the system shall be designed to provide wastewater treatment and disposal that is equal or superior to that which may be obtained with a conventional gravity drainfield system. In general, the system must provide primary treatment, advanced secondary wastewater treatment, and effluent distribution and application to soils capable

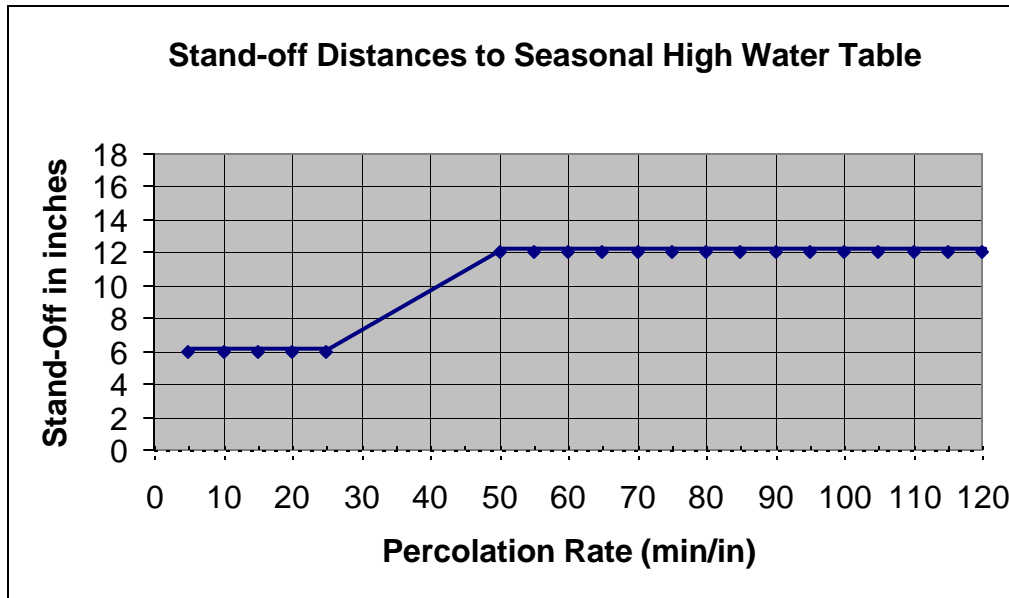


Figure 1

of providing sufficient additional treatment to render the wastewater harmless to humans and the environment. Specific deviations from the design practices contained in the *Sewage Handling and Disposal Regulations* are described below.

A. Field Design. The absorption area required may be achieved by use of the pad area, gravel absorption trenches, or a combination of both pad area and trenches provided:

1. The minimum stand-off to water table, or other limiting factor, is achieved over the entire absorption area. This assures that sufficient suitable soil, as may be required, exists between the soil and the limiting factor to provide additional treatment.

2. All pads and trenches shall be installed on contour.

3. All pad areas shall be designed such that the bottom pad area is level and

installed into natural, weathered in place soil while maintaining separation distances to all soil limiting factors. No portion of the pad bottom area may be installed on fill material.

4. The system shall be designed to provide nominally equal flow throughout all portions of the absorption area. Distribution of treated effluent by gravity or pressure dosing (after the treatment modules) is acceptable.

B. Area Requirements and Calculations. Puraflo™ systems shall be designed in

accordance with Table 2. Systems may be configured where the absorption area consists of a “pad” (absorption bed) with the treatment unit(s) placed above the absorption pad, or the absorption area may consist of gravel trenches, or a combination of trenches and pad area.

1. The size of the pad, if utilized, is generally rectangular in shape with variable dimensions established to meet the site-specific conditions encountered. The pad area shall be placed on contour and the total area shall not exceed 200 square feet per module. For the purpose of dividing flow between pads and trenches (where both are used in a single system) the following methodology is used. Flow to the pad is determined by the formula $Q = Plr * A$ where Q equals the flow to the pad in gallons, Plr equals the pad loading rate in gallons per square foot (found in Table 2) and A is the area of the pad in square feet.
2. When a pad is not utilized (typically but not necessarily Class III and IV soils) or when the flow to the pad (Q) as determined above is less than the total daily flow to the system, absorption trenches are required. Trenches utilized may be 1.5', 2.0', or 3.0' in width. The number of square feet needed is determined by establishing the flow to the trenches in gallons per day and dividing by loading rate in Table 2.
3. The minimum area for any Puraflo™ system shall be 320 square feet.
4. Conditional use permits based on limited occupancy (or other specified criteria) shall be permitted in accordance with the criteria contained in the *Sewage Handling and Disposal Regulations*.
5. No additional area reduction shall be permitted for the use of water saving fixtures.

C. Distribution. When the absorption area is located contiguous to the Puraflo™ treatment unit, Bord na Mona's design for gravity flow through adjacent gravel trenches may be used provided:

1. The bottom of all portions of the absorption area shall be installed at a single elevation (+/- 2") and on contour (requires a flat or essentially flat site), or
2. All absorption trenches shall be installed on contour. On sloping sites, parallel distribution (utilizing a distribution box or pressure distribution) shall be employed when laterals are installed on more than one elevation.
3. Distribution may be accomplished by pressure distribution before or after the treatment modules, gravity distribution to laterals out of the pad area, or gravity or

pressure distribution to a distribution box or manifold provided effluent will be applied proportionally to the absorption area as described in Part IV A (Field Design) above.

E. Depth. The minimum installation depth of the system (i.e., the bottom of the gravel pad and/or trenches that comprise the absorption area), shall be level with the naturally occurring grade. On sloping sites this shall be measured on the downhill side of the installation. Cover material shall be provided from the top edge of the Puraflo™ units horizontally in all directions to existing grade and shall cover the top and side of the pad area, which may be exposed during construction. The minimum cover over the pad area, and any trenches, shall not be less than four inches.

F. Slope. The maximum allowable slope shall be 50%.

G. Pump Design.

The Puraflo™ system contains a pump and pump chamber as an integral part of the system to dose the biofibrous media. The pump system shall comply with the criteria for pumps, pump chambers and appurtenances as found in the *Sewage Handling and Disposal Regulations*.

V. Installation.

- A. All system components shall be installed in accordance with this policy and in accordance with the manufacturer's directions.
- B. Prior to placing in operation, all mechanical components, pumps, pump cycling, and filters, must be demonstrated to be fully operational in accordance with their design.
- C. The manufacturer's recommendations shall be followed for system startup.

VI. Operation.

Bord na Mona shall provide all system owners with written and oral instructions on the proper operation and maintenance of the Puraflo™ system. At a minimum this will include the items contained in §2.5 (see attached) of the December 1994 Bord na Mona proposal. Updates, revisions and other changes to this section are the responsibility of Bord na Mona Environmental Products USA, Inc. Copies of changes shall be submitted to VDH on an informational basis.

Nothing in this approval is intended to prevent or restrict the development of instructional

materials for public use. No prior approval of such literature is required provided the literature contains no endorsements, approvals, or suggestions that VDH in any manner promotes the use of one system above any other.

VDH recognizes that all systems have operational and maintenance requirements, which are necessary to assure that performance standards are met. In order to evaluate operational and maintenance requirements, VDH reserves the right to inspect systems during normal working hours or at other reasonable times for compliance with this policy. VDH recommends at least an annual inspection of the system by a qualified individual.

VII. Responsibilities and permitting procedures.

- A. This approval has been granted specifically for the process described in the application made by Bord na Mona Environmental Products, US, Inc. for the Puraflo™ system. Any changes to the components used in this process must be reviewed and approved by VDH on a case-by-case basis prior to use.
- B. Bord na Mona may, at its discretion, establish criteria for designers and installers above and beyond any requirements established by VDH. Bord na Mona is responsible for establishing the standards for qualifying as a Bord na Mona certified designer or installer and for establishing the requirements for maintaining said certification. Enforcement of the standards established by Bord na Mona are the responsibility of Bord na Mona. VDH encourages training and certification by all proprietary system manufacturers to assure competent services are provided to customers using a proprietary system.
- C. Applications for a Puraflo™ system shall be considered in the same manner as a Type II system.
- D. Permitting shall be done by the local health department based on their satisfactory site evaluation and review of plans and specifications prepared in accordance with the manufacturer's specifications and all applicable state regulations and policies and any relevant local ordinances.
- E. Bord na Mona shall be responsible for providing up to two classes annually to VDH staff. The training shall include a manual covering proper siting, sizing, construction, installation, and inspection processes for the Puraflo™ system. All training materials, the course syllabus and training locations shall be reviewed and approved by the Division of Onsite Sewage and Water Services prior to offering the training.

VIII. Performance Expectations.

Each Puraflo™ system is expected to perform in accordance with Experimental Protocol that formed the basis for this approval. Specifically, there shall be no visible effluent on the ground surface and each system shall substantially comply with the performance criteria contained in Table I. This policy is not intended to require homeowners to sample their systems on a routine basis. When a visual examination of the system indicates that a system may not be operating within the limit established by this approval, VDH may collect, or require to be collected, sufficient samples to establish the treatment levels provided by the individual system. No single sample result shall be considered sufficient to establish a system has failed. Failure to substantially comply with performance limits established in Table 1 shall be considered as a system failure under § 12 VAC 5-610-350.